APPENDIX B
RISK MANAGEMENT AND FRATRICIDE AVOIDANCE

The primary objective of risk management and fratricide avoidance is to help units protect their combat power through accident prevention, enabling them to win the battle quickly and decisively with minimum losses. This appendix focuses on two topics: risk management and the avoidance of fratricide. Risk is the chance of injury or death for individuals and of damage to or loss of vehicles and equipment. Risks, or the potential for risks, are always present in every combat and training situation. Risk management must take place at all levels of the chain of command during each step of every operation; it is an integral part of planning. The company commander, platoon leader(s), non-commissioned officers, and all soldiers must know how to use risk management, coupled with fratricide avoidance measures, to ensure the unit executes the mission in the safest possible environment within mission constraints. For additional information on risk management, refer to FM 100-14

Section I. RISK MANAGEMENT

Risk management is the process of identifying and controlling hazards to conserve combat power and resources. Leaders must always remember that the effectiveness of the process depends on the factors of METT-TC. They should never approach risk management with "one size fits all" solutions to the hazards their unit faces. They must consider the essential tactical and operational factors that make each situation unique. There are five steps of risk management. This five-step process is integrated within the troop-leading procedures (Table B-1).

Troop Leading Procedures	Risk Management Steps				
	Step 1 Identify Hazards	Step 2 Assess Hazards	Step 3 Develop Controls and Make Risk Decisions	Step 4 Implement Controls	Step 5 Supervise and Evaluate
Receive the Mission	X				
Issue a Warning Order	X	X			
Make a Tentative Plan	X	X	X		
Initiate Movement	X	X	X	X	X
Conduct Reconnaissance		X	X	X	X
Complete the Plan		X	X		
Issue the Order				X	
Supervise/ Refine	X	X	X	X	X
Execute and Assess[1]	X	X	X	X	X
[1] All boxes are marked to emphasize the continued use of the risk management process throughout the mission.					

Table B-1. Risk management and TLP.

B-1.   IDENTIFY HAZARDS

A hazard is a source of danger. It is any existing or potential condition that could result in injury, illness, or death of personnel; damage to or loss of equipment and property; or some other form of mission degradation. Hazards arise in both tactical operations and training. Leaders must identify the hazards associated with all aspects and steps of the operation, paying particular attention to the factors of METT-TC. Risk management must never be an afterthought; leaders must begin the process during troop-leading procedures and continue it throughout the operation. Table B-2 lists possible sources of risk the company may face during a typical tactical operation. The list is organized according to the factors of METT-TC.

MISSION
Duration of the operation.
Complexity or clarity of the plan. (Is the plan well developed and easily understood?)
Proximity and number of maneuvering units.
ENEMY
Knowledge of the enemy situation.
Enemy capabilities.
Availability of time and resources to conduct reconnaissance.
TERRAIN AND WEATHER
Visibility conditions, including light, dust, fog, and smoke.
Precipitation and its effects on mobility.
Extreme temperatures.
Additional natural hazards (broken ground, steep inclines, and water obstacles).
TROOPS AND SUPPORT AVAILABLE
Equipment status.
Morale.
Experience units conducting the operation have working together.
Soldier and leader proficiency.
Soldier and leader rest situation.
Degree of acclimatization to environment.
Impact of new leaders and crewmembers.
TIME AVAILABLE
Time available for planning and rehearsals.
Time available to conduct the mission.
CIVIL CONSIDERATIONS
Applicable ROE and ROI.
Potential stability operations and support operations involving contact with civilians (such as refugee, disaster assistance, or counterterrorism).
Potential for media contacts or inquiries.

Table B-2. Examples of potential hazards.

B-2.   ASSESS HAZARDS TO DETERMINE RISKS
Hazard assessment is the process of determining the direct impact of each hazard on an operation (in the form of hazardous incidents). Use the following steps.

a.   Determine what hazards can be eliminated or avoided.

b.   Assess each hazard that cannot be eliminated or avoided to determine the probability that the hazard will occur.

c.   Assess the severity of hazards that cannot be eliminated or avoided. Severity, defined as the result or outcome of a hazardous incident, is expressed by the degree of injury or illness (including death), loss of or damage to equipment or property, environmental damage, or other mission-impairing factors (such as unfavorable publicity or loss of combat power).

d.   Take into account both the probability and severity of a hazard and determine the associated risk level (extremely high, high, moderate, or low). Table B-3 summarizes the four risk levels.

e.   Based on the factors of hazard assessment (probability, severity, and risk level, as well as the operational factors unique to the situation), complete risk management worksheet. (Refer to Figure B-1, page B-4, for an example of a completed risk management worksheet.)

RISK LEVEL	MISSION EFFECTS
Extremely high (E)	Mission failure if hazardous incidents occur in execution.
High (H)	Significantly degraded mission capabilities in terms of required mission standards. Not accomplishing all parts of the mission or not completing the mission to standard (if hazards occur during mission).
Moderate (M)	Expected degraded mission capabilities in terms of required mission standards. Reduced mission capability (if hazards occur during the mission).
Low (L)	Expected losses have little or no impact on mission success.

Table B-3. Risk levels and impact on mission execution.

A. Mission or Task: Conduct a deliberate attack	B. Date/Time Group Begin: 010035R May XX End: 010600R May XX	C: Date Prepared: 29 April XX

D. Prepare By: (Rank, Last Name, Duty Position)	CPT Smith, Cdr				
E. Task	**F. Identify Hazard**	**G. Assess Hazard**	**H. Develop Controls**	**I. Determine Residual Risk**	**J. Implement Controls (How To)**
Conduct obstacle breaching operations	Obstacles	High (H)	Develop and use obstacle reduction plan	Low (L)	Unit TSOP, OPORD, training handbook
	Inexperienced soldiers	High (H)	Additional training and supervision	Moderate (M)	Rehearsals, additional training
	Operating under limited visibility	Moderate (M)	Use NVDs, use IR markers on vehicles	Low (L)	Unit TSOP, OPORD
	Steep Cliffs	High (H)	Rehearse using climbing ropes	Moderate (M)	FM 3-97.6, Mountain Operations; TC 90-6-1, Mountaineering
	Insufficient planning time	High (H)	Plan and prepare concurrently	Moderate (M)	OPORD,Troop-leading procedures

K. Determine overall mission/task risk level after controls are implemented (circle one)

LOW (L)   (MODERATE (M))   HIGH (H)   EXTREMELY HIGH (E)

Figure B-1. Completed risk management worksheet.

B-3. DEVELOP CONTROLS AND MAKE RISK DECISIONS

Step 3 consists of two substeps: develop controls and make risk decisions. This step is done when making a tentative plan (COA development, COA analysis, COA comparison, and COA approval) during the troop-leading procedures.

a. **Develop Controls.** Controls are the procedures and considerations the unit uses to eliminate hazards or reduce their risk. After assessing each hazard, develop one or more controls that will either eliminate the hazard or reduce the risk (probability, severity, or both) of potential hazardous incidents. When developing controls, consider the <u>reason</u> for the hazard, not just the hazard itself.

b. **Make Risk Decisions.** A key element in the process of making a risk decision is determining whether accepting the risk is justified or, conversely, is unnecessary. The decision-maker must compare and balance the risk against mission expectations, then decide if the controls are sufficient and acceptable and whether to accept the resulting residual risk. If the risk is determined unnecessary, the decision-maker directs the development of additional controls or alternative controls; as another option, he can modify, change, or reject the selected COA for the operation.

B-4. IMPLEMENT CONTROLS

Implementing controls is the most important part of the risk management process. It is the chain of command's contribution to the safety of the unit. Implementing controls includes coordination and communication with appropriate superior, adjacent, and

subordinate units and with individuals executing the mission. The company commander or platoon must ensure that specific controls are integrated into orders, SOPs, and rehearsals. The critical check for this step is to ensure that controls are converted into clear, simple execution orders understood by all levels. If the leaders have conducted a thoughtful risk assessment, the controls will be easy to implement, enforce, and follow. Examples of risk management controls include the following:

- Thoroughly brief all aspects of the mission, including related hazards and controls, and ensure that subordinates know the plan.
- Allow adequate time for rehearsals at all levels.
- Drink plenty of water, eat well, and get as much sleep as possible (at least 4 hours in any 24-hour period).
- Enforce speed limits, use of seat belts, and driver safety.
- Establish control measures or recognizable visual signals and markers to distinguish maneuvering units.
- Enforce the use of ground guides in assembly areas and on dangerous terrain.
- Limit single-vehicle movement.
- Establish SOPs for the integration of new personnel.

B-5. SUPERVISE AND EVALUATE

During mission execution, leaders must ensure their subordinates properly understand and execute risk management controls. Leaders must continuously evaluate the unit's effectiveness in managing risks to gain insight into areas that need improvement.

a. **Supervision.** Leadership and unit discipline are the keys to ensuring implementation of effective risk management controls. All leaders are responsible for supervising mission rehearsals and execution to ensure standards and controls are enforced. In particular, NCOs must enforce established safety policies as well as controls developed for a specific operation or task. Techniques include spot checks, inspections, SITREPs, confirmation briefs, and supervision. During mission execution, leaders must continuously monitor risk management controls to determine whether they are effective and to modify them as necessary. Leaders must also anticipate, identify, and assess new hazards. They ensure that imminent danger issues are addressed on the spot and that ongoing planning and execution reflect changes in hazard conditions.

b. **Evaluation.** Whenever possible, the risk management process should also include an after-action review (AAR) to assess unit performance in identifying risks and preventing hazardous situations. Leaders should then incorporate lessons learned from the process into unit SOPs and plans for future missions.

c. **Commanders Guidance.** The company commander gives the platoon leaders direction, sets priorities, and establishes the command climate (values, attitudes, and beliefs). Successful preservation of combat power requires him to imbed risk management into individual behavior. To fulfill this commitment, leaders must exercise creative leadership, innovative planning, and careful management. Most importantly, the commander must demonstrate support for the risk management process within the troop-leading procedures. The commander and others in the chain of command can establish a command climate favorable to risk management integration by--

- Demonstrating consistent and sustained risk management behavior through leading by example and stressing active participation throughout the risk management process.
- Providing adequate resources for risk management. Every leader is responsible for obtaining the assets necessary to mitigate risk and for providing them to subordinate leaders.
- Understanding their own and their soldier's limitations, as well as their unit's capabilities.
- Allowing subordinates to make mistakes and learn from them.
- Demonstrating full confidence in subordinates' mastery of their trades and their ability to execute a chosen COA.
- Keeping subordinates informed.
- Listening to subordinates.

d. **Leader Responsibility.** For the commander, his subordinate leaders, and individual soldiers alike, responsibilities in managing risk include the following:

- Making informed risk decisions; establishing and then clearly communicating risk decision criteria and guidance.
- Establishing clear, feasible risk management policies and goals.
- Training the risk management process. Ensure subordinates manage risk and understand how risk management applies to their situation and assigned responsibilities..
- Accurately evaluating the unit's effectiveness as well as subordinates' execution of risk controls during the mission.
- Informing higher headquarters when risk levels exceed established limits.

Section II. FRATRICIDE AVOIDANCE

Fratricide avoidance is a complex problem defying simple solutions. Fratricide can be defined broadly as the unforeseen and unintentional death or injury to friendly personnel and damage of or loss of equipment as a result of employing friendly weapons and munitions with the intent of killing the enemy or destroying his equipment or facilities. This section focuses on actions leaders can take to reduce the risk and occurrence of fratricide using current resources.

B-6. MAGNITUDE OF THE PROBLEM

The modern battlefield is more lethal than any battlefield in history. The tempo of operations is rapid, and the nonlinear nature of the battlefield creates command and control challenges for unit leaders. The accuracy and lethality of modern weapons make it possible to engage and destroy enemy targets at extended ranges. However, the ability of US forces to acquire targets using thermal imagery and other sophisticated sighting systems exceeds its capability to accurately identify these targets. Consequently, friendly elements can be engaged unintentionally and destroyed in a matter of seconds. Added to this is battlefield obscuration, which becomes a critical consideration whenever thermal sights are the primary source of target identification. Rain, dust, fog, smoke, and snow degrade identification capability by reducing the intensity and clarity of thermal images. On the battlefield, positive visual identification cannot be the sole engagement criteria at

ranges beyond 1,000 meters. A common operational picture, either digital or analog, is essential and must be maintained throughout any operation.

B-7. RISK IDENTIFICATION AND PREVENTIVE MEASURES

Reduction of fratricide risk begins during the planning phase of an operation and continues through preparation and execution. Risk identification must be conducted at all levels during each phase and the results clearly communicated up and down the chain of command so risk assessment can begin. The following paragraphs cover considerations influencing risk identification and focuses on measures the leader can implement to make the identification process more effective and help prevent friendly fire incidents from occurring.

B-8. PLANNING

A thoroughly developed, clearly communicated, and completely understood plan helps minimize fratricide risk. The following factors affect the potential for fratricide in a given operation:

- Clarity of the enemy situation.
- Clarity of the friendly situation.
- Clarity of the commander's intent and concept of operations.
- Complexity of the operation.
- Planning time available at each level.

Graphics are a basic tool commanders at all levels use to clarify their intent, add precision to their concept, and clearly communicate their plan to subordinates. Graphics can be a very useful tool in reducing the risk of fratricide. Each commander must understand the definitions and purposes of operational graphics and the techniques of their employment. FM 1-02 (101-5-1) defines each type of graphic control measure.

B-9. PREPARATION

Confirmation briefs and rehearsals are primary tools for identifying and reducing fratricide risk during preparation for an operation. The following are considerations for their use:

a. Confirmation briefs and rehearsals ensure subordinates know where fratricide risks exist and what to do to reduce or eliminate them.

b. Briefbacks ensure subordinates understand the commander's intent. They often highlight areas of confusion or complexity or planning errors.

c. The type of rehearsal conducted determines the types of risks identified.

d. Rehearsals should extend to all levels of command and involve all key players.

e. The following factors may reveal fratricide risks during rehearsals:

- Number and type of rehearsals.
- Training and proficiency levels of units and individuals.
- The habitual relationships between units conducting the operation.
- The physical readiness (endurance) of the troops conducting the operation.

B-10. EXECUTION
Risk assessments continuing during execution and improvisation can overcome unforeseen fratricide risk situations.

a. The following are factors to consider when assessing fratricide risks:
- Intervisibility between adjacent units.
- Amount of battlefield obscuration.
- Ability or inability to identify targets positively.
- Similarities and differences in equipment, vehicles, and uniforms between friendly and enemy forces.
- Vehicle density on the battlefield.
- The tempo of the battle.

b. Maintaining a COP of friendly forces at all levels and at all times is another key to fratricide avoidance as an operation progresses. Units develop and employ effective techniques and SOPs to aid leaders and crewmen in this process, to include--
- Monitoring the next higher radio or digital net.
- Radio and digital cross-talk between units.
- Accurate position reporting and navigation.
- Training, use, and exchange of liaison officers.

B-11. FRATRICIDE REDUCTION MEASURES
The following measures provide a guide to actions that can reduce fratricide risk. Use of these measures is not required, nor are they intended to restrict initiative. Apply them as appropriate based on the specific situation and METT-TC factors:

a. Identify and assess potential fratricide risks in the estimate of the situation. Develop a simple, decisive plan and express these risks in an order (WARNO, OPORD or FRAGO).

b. Focus on areas such as current intelligence, unit locations and dispositions, denial areas (minefields and FASCAM), contaminated areas such as improved conventional munitions (ICM) and NBC, SITREPs, and METT-TC factors.

c. Ensure positive target identification. Review vehicle and weapon ID cards. Know at what ranges and under what conditions positive identification of friendly vehicles and weapons is possible.

d. Establish a command climate that stresses fratricide prevention. Enforce fratricide prevention measures and emphasize the use of doctrinally sound techniques and procedures. Ensure constant supervision in the execution of orders and the performance of all tasks and missions.

e. Recognize the signs of battlefield stress. Maintain unit cohesion by taking quick, effective action to alleviate battlefield stress.

f. Conduct individual, leader, and collective (unit) training covering fratricide prevention, target identification and recognition, and fire discipline.

g. Use SOPs that are consistent with doctrine to simplify mission orders. Periodically review and change SOPs as needed.

h. Strive for maximum planning time for your subordinates.

i. Use doctrinally correct standard terminology and control measures, such as fire support coordination line and restrictive fire lines.

j. Ensure thorough coordination is conducted.

k. Plan for and establish effective communications (to include visual).

l. Plan for collocation of command posts whenever it is appropriate to the mission, such as during a passage of lines.

m. Ensure ROE are clear.

n. Include fratricide risk as a key factor in terrain analysis (OAKOC).

o. Conduct rehearsals whenever the situation allows time to do so.

p. Be in the right place at the right time. Use position location and navigation devices (GPS and POSNAV); know your location and the locations of adjacent units (left, right, leading, and follow-on). Synchronize tactical movement.

q. Plan and brief OPSEC (challenge and password, sign and countersign).

r. Whenever possible, the risk management process should also include AAR to assess unit performance in identifying risks and preventing hazardous situations. Leaders should then incorporate lessons learned from the process into unit SOPs and plans for future missions.

s. Stress the importance of the chain of command in the fire control process (see Appendix C); ensure soldiers get in the habit of obtaining target confirmation and permission to fire from their leaders before engaging targets they assume are enemy elements.

t. Ensure fire commands are accurate, concise, and clearly stated. Make it mandatory for soldiers to ask for clarification of any portion of the fire command that they do not completely understand.

B-12. FRATRICIDE AVOIDANCE CONSIDERATIONS

Table B-4, pages B-10 and B-11, contains key factors and considerations in fratricide avoidance, paralleling the five-paragraph operations order format. This is not a change to the OPORD format but is a technique to ensure fratricide avoidance measures are included when completing the plan during the TLP. The factors and considerations are listed where they would likely appear in the OPORD, but they may warrant evaluation during preparation of other paragraphs.

Task Organization:
- Has the unit worked under this task organization before?
- Are SOPs compatible with the task organization (especially with attached units)?
- Are special markings or signals (for example, cats' eyes, chemlites, or panels) needed for positive identification of uniforms and equipment?
- What special weapons and equipment are to be used? Do they look or sound like enemy weapons and equipment?

1. **Situation**.
a. *Enemy Forces*.
    (1) *Weather*:
        - What are the expected visibility conditions (light data and precipitation) for the operation?
        - What affects will rain, heat, and cold have on soldiers, weapons, and equipment?
    (2) *Terrain*:
        - Do you know the topography and vegetation (urban, mountainous, hilly, rolling, flat, desert, swamp/marsh, prairie/steppe, jungle, or open woods) of the expected AO?
        - Have you evaluated the terrain using the factors of OAKOC?
b. *Friendly Forces*.
    - Among the allied forces, are there differences (or similarities with enemy forces) in language, uniform, and equipment that could increase fratricide risk during combined operations?
    - Could differences in equipment and uniforms among US armed forces increase fratricide risk during joint operations?
    - What differences in equipment and uniforms can leaders stress to help prevent fratricide?
    - What is the friendly deception plan?
    - What are the locations of your unit and adjacent units (left, right, leading, and follow-on)?
    - What are the locations of neutrals and noncombatants?
    - What are the locations of your own forces?
    - What is the status of training activities?
    - What are the levels of individual, crew, and unit proficiency?
    - Will fatigue be a factor for friendly forces during the operation? Has an effective sleep plan been developed?
    - Are friendly forces acclimatized to the AO?
    - What is the age (new, old, or mixed) and condition of equipment in friendly units?
    - What is the status of new equipment training?
    - What are the expected MOPP requirements for the operation?
c. *Attachments and Detachments*.
    - Do attached elements understand pertinent information regarding enemy and friendly forces?
    - Will gaining units provide this pertinent information to detached elements?
    - Are communications systems compatible (digital/analog)?

2. **Mission**.
    - Do all elements clearly understand the mission and all associated tasks and purposes?

Table B-4. Fratricide avoidance checklist.

3. **Execution**.
a. *Concept of the Operation*.
(1) *Maneuver*: Are main and supporting efforts identified?
(2) *Fires (Direct and Indirect)*:
- Are priorities of fires identified?
- Have target lists been developed?
- Have the fire execution matrix and overlay been developed?
- Have locations of denial areas (minefields and FASCAM) and contaminated areas (ICM and NBC) been identified?
- Are the locations of all supporting fire targets identified in the order and overlays?
- Are aviation and CAS targets clearly identified?
- Has the direct fire plan been developed?
- Have FPFs been designated?
- Are the requirements for accurate predicted fire met or do we have to adjust fire?
(3) *Engineer Tasks*:
- Are friendly minefields, including FASCAM and ICM dud-contaminated areas, known?
- Have obstacles and the approximate time needed for reduction or breaching of each been identified?
(4) *Tasks to Each Subordinate Unit*: Are friendly forces identified, as appropriate, for each subordinate maneuver element?
(5) *Tasks to CS and CSS Units*: Have locations of friendly forces been reported to CS and CSS units?
b. *Coordinating Instructions*.
- Will rehearsals be conducted? Are they necessary? Are direct and indirect fires included?
- Is a confirmation brief necessary?
- Are appropriate control measures clearly explained and illustrated in the order and overlays? Have they been disseminated to everyone who has a need to know? What is the plan for using these control measures to synchronize the battle and prevent fratricide?
- Have target and vehicle identification drills been practiced?
- Do subordinate units know the immediate action, drill, or signal for "CEASE FIRE" and "I AM FRIENDLY" if they come under unknown or friendly fire? Is there a backup?
- Is guidance in handling dud munitions, such as ICM and cluster bomb units (CBU), included?

4. **Service Support**.
- Does everyone know trains locations and identification markings?
- Do medical and maintenance personnel know the routes between train units?
5. **Command and Signal**.
a. *Command*.
- What are the locations of the commander and key staff members?
- What are the chain of command and the succession of command?
b. *Signal*.
- Do instructions include backup code words and visual signals for all special and emergency events?
- Do instructions cover how to identify friendly forces to aircraft?
- Do they include backup code words and visual signals for all special and emergency events?
- Are SOI distributed to all units with a need to know, such as higher, lower, adjacent, leading, and follow-on elements?

Table B-4. Fratricide avoidance checklist (continued).